



ELASTO-VALVE RUBBER PRODUCTS INC.

Storage, Installation and Maintenance Instructions

STORAGE :

The environment in which an expansion joint is stored directly affects the performance of that joint. Certain industrial and natural atmospheres can be detrimental to some materials used in the manufacturing of expansion joints. If an expansion joint is stored for a long period of time, over one year, inspection of the flexible element, prior to installation, is critical.

Disregard for proper storage practice will invalidate our warranty.

If you plan to store an expansion joint for an extended period of time or if you are just preparing to install a joint that has been stored for an extended period of time, contact '**EVR**' for their recommendations.

Special Storage methods should be taken when long-term field storage is anticipated for items such as spares.

Inspection should be made at least 45 days prior to the anticipated installation. If during inspection you notice something out of ordinary or unusual contact '**EVR**'.

Recommendations :

Protect joints from physical damage and abuse.

If the expansion joints must be stored outdoors then store them at least one foot above the ground in a dry area where flooding will not occur. Cover the joints with a tarpaulin or heavy plastic to protect the containers from weather.

Store in an area where the temperature will not exceed 150°F. Store in a cool, dry area to help prevent mildew.

The ideal storage temperature for the expansion joints is 50 to 70°F, with a maximum limit of 175°F. Expansion joints should not be stored near sources of heat such as radiator or base heater. The minimum temperature for fluoroelastomer coated fabrics to be 32°F at time of installation.

Expansion joints should not be stored near electrical equipment that may generate ozone.

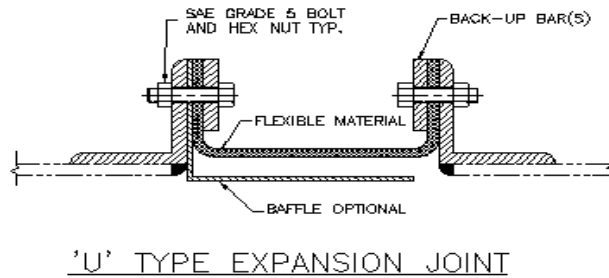
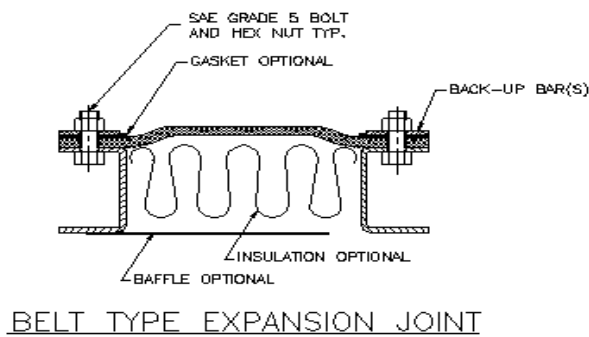
INSTALLATION:

The following procedures are guidelines that will aid in the installation of 'EVR' expansion joints. These installation procedures may have to be modified due to conditions at the job site or because of the size. No matter what the conditions, however, it is always important to prevent damage by careless handling and to keep the expansion joints supported during installation.

Bolting:

Correct bolting procedures should be adhered to!

For U-shaped (flanged) style expansion joints, bolts must be installed so they extend away from the breach opening and back-up bars. The bolt head should be next to the backing bar. If not, the bolts can damage the expansion joint. For high temperature flat belt designs (400°F and greater), the bolts should point up through the back-up bars. This allows for better heat dissipation and therefore longer life. For low temperature flat belt joints, the bolt orientation is not critical; therefore use the method that best facilitates installation.



Torque recommendations are as follows:

- a. Composite type expansion joints - 50 lb.ft
- b. Elastomeric type joints - 35 lb.ft

Guidelines:

The breach opening should be checked for misalignment and flange-to-flange dimension. If flanges are misaligned or exceed the breach opening shown in the drawings, contact 'EVR' immediately.

Breach opening tolerances should not exceed more than $\pm 1/4''$ in all directions.

The mating flanges of the expansion joint attachment area of the ductwork must be smooth, clean and parallel.

The area around the ductwork must be cleared of any sharp objects and protrusions. If not removable they should be marked for avoidance.

If any handling devices such as crane hooks or forklifts are utilized in handling the joint, the contact surface must be protected by soft cushioning materials.

If welding or burning operations are being performed in the vicinity of exposed expansion joints, fabric welding blankets or other protective covering must be used. These covers must be removed before system start-up.

Don not insulate over any expansion joint without first consulting with 'EVR'. 'EVR' will not be held responsible for the performance of the joint if it is externally insulated without prior knowledge.

Backing bars should not overlap; they should butt up to each other. A gap over $1/4''$ can be corrected by placing a shim under the bars, spanning the gap.

If the expansion joints are shipped open for field splicing, consult with 'EVR' for specific splicing instructions.

Contact 'EVR' for field splicing service at 800-461-6331

Insulating pillows are used to reduce the temperature that the flexible element is exposed to in high temperature applications and to prevent fly ash build-up in the cavity of the expansion joint.

Protective cover over the expansion joint (if necessary) must be perforated to allow free airflow over the outside of the expansion joint. The suggested cover is heavy gauge open screening or grating. If the expansion joint is located in an area of high outside heat source or an area where there is no airflow over the expansion joint, contact 'EVR'.

Installing U-shaped (flanged) and Belt type joints:

These installation requirements may have to be modified for conditions at the job site or because of the expansion joint size. No matter what the condition, however, it is always important to prevent damage by careful handling and by supporting the expansion joint during installation.

Installation In Vertical Duct:

(Expansion joint in horizontal position)

- a. The breach opening should be checked for misalignment and flange-to-flange dimensions. If the flanges are misaligned or exceed the breach opening shown in **figure 'A'**, contact 'EVR' for consultation immediately. Normal tolerance: 1/4"
- b. Clear the working area of sharp objects and protrusions.
- c. Place baffles inside of ductwork if part of installation. Do not weld.
- d. Build platform of 3/4" plywood or other suitable material near ductwork breach as demonstrated in **figure 'A'**. This must be movable and sufficiently large to lay out the expansion joint in approximate installed shape.

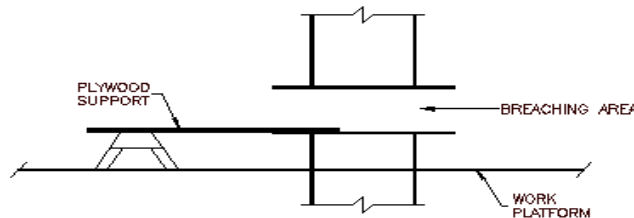


Figure A

- e. Transport the expansion joint to the area of installation in its shipping container if possible. If not, the expansion joint should be lifted with a rope or rubber slings in folded, tied condition.
- f. Remove from the container, unfold and lay out the expansion joint in the approximate installed position. Exercise care to prevent the expansion joint from coming into contact with sharp objects. See **figure 'B'**.
- g. Inspect the expansion joint thoroughly for damage, both inside and outside. Notify 'EVR' of any damage for evaluation and/or recommendation.

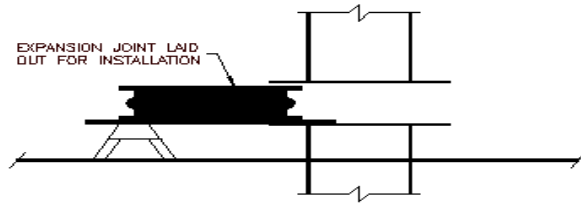


Figure B

- h. Compress the expansion joint by squeezing the flanges together (flange-to-flange). Tie it down with tape in several places to hold the compression. The total compressed dimension must be less than the breach opening to allow for clearance during the positioning of the expansion joint in the breach opening.
- i. Using sufficient help, slide the plywood with the expansion joint into the breach opening. See **figure 'C'**.
- j. Continuing to use plywood or other support, place the expansion joint in the approximate position in relation to the flanges. Cut the tapes holding the joint in compression.

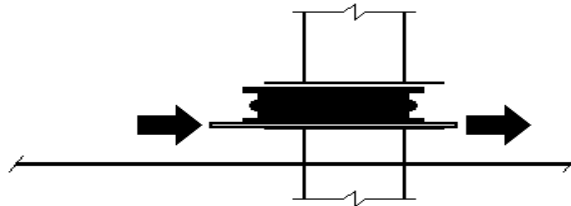


Figure C

- k. Position back up bars over the upper flange areas of the expansion joint, lining up holes at corners. Make sure the joint is properly centered. Install several positioning bolts.
- l. Remove the plywood support from under the expansion joint, leaving the opposite flange in position against the mounting frame.
- m. Repeat step 'k' for the lower flange.
- n. Weld baffles into place (see instruction on baffles), if baffles are part of the installation.

Installation In Horizontal Duct:

(Expansion joint in vertical position)

- a. The breach opening should be checked for misalignment and flange-to-flange dimensions. If the flanges are misaligned or exceed the breach opening shown in **figure 'D'**, contact **'EVR'** for consultation immediately. Normal tolerance: 1/4"

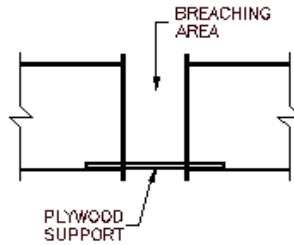


Figure D

- b. The flanges of the ductwork should be smooth, uniform and parallel.
- c. Clear the working area of sharp objects and protrusions.
- d. Place baffles inside of the ductwork, if part of installation. (See instructions on baffles). Do not weld.
- e. Prepare an open work area to lay out the expansion joint. The area should be adjacent to the duct opening or, if necessary, on the ground at the site.
- f. Transport the expansion joint to the area of installation in its shipping container if possible. If not, the expansion joint should be lifted with a rope or rubber slings in folded, tied condition.
- g. Remove it from the container, unfold and lay out the expansion joint in the approximate installed position. Exercise care to prevent the expansion joint from coming into contact with sharp objects.
- h. Inspect the expansion joint thoroughly for damage, both inside and outside. Notify 'EVR' of any damage for evaluation and/or assistance.
- i. Bolt the back-up bars and the expansion joint to upper duct flanges. Bolts on flanged expansion joints are to be inserted with the head of the bolt next to the back-up bar and with the nut next to the duct flange. Reverse bolts for belt joints. If insulating washers are specified, make sure they are installed. They are required for the successful operation of the expansion joint. Torque the bolts to recommended values shown on **page 2**.
- j. Lash a stiffener bar (wood, steel, or other suitable material) to inside of top of the expansion joint with nylon tape or rope (see **figure 'E'**). This is to aid in hoisting and positioning of the joint in breach opening.
- k. Compress the expansion joint by squeezing the flanges together (flange-to-flange). Tie it down with tape in several places to hold the compression. The total compressed dimension must be less than the breach opening to allow for clearance during position of the expansion joint in the breach opening.
IMPORTANT - Tie the centre bottom of the joint to the top for support, to prevent overloading of corners on large heavy expansion joints as shown in **figure 'E'**.

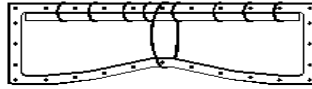


Figure E

- l. Hoist the expansion joint to the duct opening and position the joint between flanges using rope guides. (See **figure 'F'**)
- m. Place a sheet of plywood at the bottom of the duct opening for support of the expansion joint during installation.
- n. Cut the tapes holding the expansion joint in compression. Also, cut the tape holding the bottom of the joint to the top.

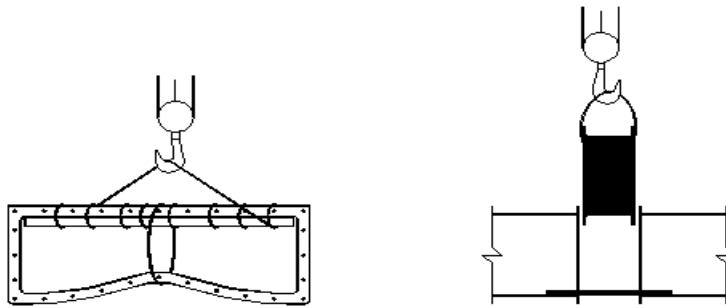


Figure F

- o. Position the back-up bars over the upper flange areas of expansion joint, lining up holes at corners. Make sure the expansion joint is properly centered. Install several pre-positioning bolts.
- p. Remove the stiffener support.
- q. Bolt the back-up bars and the expansion joint to upper duct flanges. Bolts on flanges expansion joints are to be inserted with the head of bolt next to the back-up bar and with the nut next to the duct flange. Reverse bolts for belt joints. If insulating washers are specified, make sure they are installed. They are required for the successful operation of the expansion joint. Torque the bolts to recommendations found on **page 2**.
- r. Remove the bottom support.
- s. Bolt the expansion joint to bottom duct flanges.
- t. Weld baffles into place where required (see installation instruction on baffles), if baffles are part of the installation.

Alternate Method Of Installation In A Horizontal Duct:

See steps 'a' through 'h' in the horizontal duct installation; it is the same for the alternate method.

- i. Fit the back-up bars to both expansion joint flanges inserting every 4th or 5th bolt and applying nuts to hold back-up bars in place. Lash a stiffener bar (wood, steel or suitable material) to the top of the expansion joint with nylon strapping tape. This is to aid in hoisting and positioning of the joint in the breach opening.
- j. Before lifting to position, compress expansion joints by squeezing the flanges together (flange-to-flange). After compressing 2 to 3", tape in compressed configuration with nylon strapping tape. **IMPORTANT** - Tie the centre bottom of the joint to the top for support to prevent overloading of corners on the large, heavy expansion joints.
- k. Hoist the prepared joint to the duct opening and position between ducting flanges. Install several positioning bolts to the topside of one ducting flange, removing previously inserted bolts as required.
- l. Install several positioning bolts to sides and bottom of the same ducting flange.
- m. Cut the tapes holding the joint in compression. Also, cut the tape holding the bottom of the joint to the top. Remove the top support.
- n. Complete bolting around the one flange and bolt the opposite flange in the same manner (see bolt torque recommendation on **page 2**).
- o. Weld baffles into place where required, if baffles are part of the installation.

Installation Of Expansion Joints With Field Splice:

- a. The breach opening should be checked for misalignment and flange-to-flange dimensions. If the flanges are misaligned or exceed the breach opening, contact 'EVR' for consultation immediately.
- b. The flanges of the ductwork should be smooth, uniform and parallel.
- c. Clear the working area of sharp objects and protrusions.
- d. Prepare an open work area to lay out the expansion joint. The area should be adjacent to the duct opening or, if necessary, on the ground at the site.
- e. Transport the expansion joint to the area of installation in its shipping container if possible. If not, the expansion joint should be lifted with a rope or rubber slings in folded, tied condition.

- f. Remove from the container, unfold and lay out the expansion joint in the approximate installed position. Exercise care to prevent the expansion joint from coming into contact with sharp objects.
- g. Inspect the expansion joint thoroughly for damage, both inside and outside. Notify 'EVR' of any damage for evaluation and/or assistance.
- h. The expansion joint is normally spliced at the mid-point of the long side or the short side. See 'EVR' drawings for clarification. Find the mid-point of the duct flange on the long side. Start at this point and unfold the expansion joint around the duct, keeping the side marked "outside" to the outside.
- i. On the horizontal ducts, always position the splice on top or sides, never on the bottom.
- j. Keep the expansion joint supported on a platform while unfolding and positioning. Do not hang the expansion joint by the boltholes, as its weight could tear the holes.
- k. Locate the corners opposite to the splice. Start at either corner and install the lower or upper flange on the backside of the duct. Continue from the corner along the sides and install the back-up bars. **DO NOT INSTALL THE BARS 6 TO 8 ft ON EITHER SIDE OF THE SPLICE.**
- l. Compress the expansion joint until the boltholes along the lower flange align. Install the back-up bars in the same manner as above.

NOTE: OTHER ACCESSORIES, SUCH AS BAFFLES OR LINER PLATES CAN BE PROVIDED FROM 'EVR' ON CUSTOMER'S REQUEST, THEREFORE INSTALLATION INFORMATION WOULD BE PROVIDED TO THE CUSTOMER IF BAFFLES OR LINER PLATES ARE PURCHASED FROM 'EVR'.

INSPECTION AND MAINTENANCE:

If the expansion joints are located in an area where fly ash, coal dust or debris might accumulate, periodic inspection must be implemented.

After start up retorque the bolting as previously recommended. Periodic checking of fly ash build-up can be easily accomplished by pushing the joint cover to determine the extent of the loading. If the accumulation of ash is extensive contact 'EVR' for recommended procedure to remove the build-up during your next outage. If the fly ash solidified increase your number of inspections. Solid ash can cause damage to the expansion joint and the duct.

Inspect for any debris that may have collected on the top of expansion joints in a horizontal duct. Collection of scrap iron, insulation materials or fly ash will insulate the exterior cover of an expansion joint, causing premature failure.

Check for any accumulation of coal dust on the external cover of the expansion joint. Coal dust should be removed immediately. The accumulation of dust can spontaneously ignite and burn the cover of the expansion joint.

Inspect for cracked or leaking interfacing metal flanges, which allow the spillage of hot flue gas onto the outside cover of the expansion joint. These cracked welds should be repaired as soon as possible to protect the joint.

Regular expansion joint inspection is the best method to insure proper performance and obtain maximum life.

'EVR' is available for full plant expansion joint inspections.